EN

25/06 - 6193641_01
Translation of Original instructions

URX-CF / URHE-CF

User manual

RECOVERY UNIT WITH COOLING CIRCUIT

AERMEC

www.aermec.com

Dear Customer,
Thank you for wanting to learn about a product Aermec. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies.
The manual you are about to read is meant to present the product and help you select the unit that best meets the needs of your system.
However, please note that for a more accurate selection, you can also use the Magellano selection program, available on our website.
Aermec, always attentive to the continuous changes in the market and its regulations, reserves the right to make all the changes deemed necessary for improving the product, including technical data.
Thank you again.

Aermec S.p.A.

SAFETY CERTIFICATIONS

CE

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled disposal of Waste Electrical and Electronic Equipment (WEEE), please return the device using appropriate collection systems, or contact the retailer where the product was purchased. Please contact your local authority for further details. Illegal dumping of the product by the user entails the application of administrative sanctions provided by law.

TABLE OF CONTENTS

1 WARNING AND HAZARD TERMS

Before proceeding with any assessment or operation on the unit, carefully read this manual and all of its notes marked with the following symbols, which indicate the various levels of hazard or situations that are potentially hazardous to prevent malfunctioning or physical damage to property or personal injury:

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

The sign shows the components of the unit or, in this manual, identifies actions that could cause electrical risks.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

MANDATORY

This indicates a mandatory action that, if not carried out, could cause death or serious injuries.

PROHIBITION

Indicates a prohibited action which, if not avoided, could result in death or serious injury.

NOTICE

IMPORTANT additional information on how to use the product

2 INTRODUCTION

The controller is the compact device that makes it possible to control units for single-circuit air-to-air conditioning.

NOTICE

Pay special attention to the usage regulations marked by the word "DANGER" or "WARNING" or by the "safety symbols", as failure to respect them may lead to harm to people and/or damage to the machine/ property.

If any malfunctions are not included in this manual, contact the local After-sales Service immediately.

The manufacturer cannot be held liable for any damage caused by the improper use of the machine, or by the partial or superficial reading of the information given in this manual.

Installation and maintenance must be carried out by expert and qualified personnel, according to the legal requirements in force in the country of installation for the electrical/electronic as well as air conditioning installations. Failing this, the manufactures declines any liability with regards to the safety of the product.

THE MANUFACTURER DECLINES ANY LIABILITY FOR DAMAGES TO PERSONS, ANIMALS OR PROPERTIES CAUSED BY THE FAILURE TO OBSERVE THE INSTRUCTIONS AND REGULATIONS INCLUDED IN THIS MANUAL.
Although during the design of the units, an appropriate analysis of the risks was carried out, pay ATTENTION to the pictograms on the machine that make reading the manual easier by drawing the reader's attention on the situations posing risks that cannot be avoided or sufficiently limited by adopting protection measures and technical solutions.

MAIN WARRANTY CONDITIONS

— The warranty does not include the payment for damages due to wrong installation of the unit by the operator.
— The warranty does not include the payment for damages due to improper use of the unit by the operator.
— The factory shall not be liable for incidents occurred to the installer or user, arising from wrong installation or improper use of the unit.

The warranty is not valid only in case:
— Services and repairs are carried out by non-authorised personnel and companies;
— the unit was previously repaired or modified with non-original spare parts;
— no proper maintenance was carried out on the unit;
— in case the instructions in this manual were not followed;
— if non-authorised modifications were carried out.

NOTICE

The factory reserves the right to make any changes in order to improve its products at any time, and is not obliged to add these modifications to previously manufactured machines, those that have already been delivered or those under construction. Warranty conditions are in any case subject to the general sales conditions that are in place when the contract is stipulated.

3 MAIN FEATURES

General information

The unit is fitted with an electrical panel with a power and regulation section (including the three-way valves for the integrated hot water coil, if present, and the related servomotors), for the control of all cooling circuit functions. The following is included: NTC temperature probe on the ambient air intake, outside air NTC temperature probe, pressure switch on the intake filter. With the free cooling accessory, the dampers and related servomotors are provided. A remote control terminal is also provided for the automatic control of the unit, with remote control up to 100 metres (cable not provided).
The main functions of the regulation system are as follows:
— thermo-regulation depending on the temperature detected by the air probe located on the recovery;
— defrosting control;
— Remote On-Off;
— summer/winter switching
— integrated electric coil control for heating (if present);
— integrated water coil control for heating (if present);
— menu user interface;
— remote keyboard (up to 100 m) that can be directly connected without serial interfaces (electrical cable not provided);
— RS485 serial board with series ModBus protocol.

Diagnostic

The regulation system includes the notification of the following faults:
— defective temperature probe
— cooling circuit high and low pressure
— compressor thermal protection
— fan thermal protection.

4 REMOTE KEYBOARD ASSEMBLY

The connection between the control board of the remote keyboard and control board of the electrical panel takes place through electrical cables that are not provided (shielded cables with a section of at least 0.5 mm^2,, max. length 100 m).
For the connection to the clamps, refer to the section "Remote keyboard connection".
Access to the keyboard control board takes place by remove the front part (by means of a screwdriver or similar tool) as fig. 01 shows.
The cables can pass through the central hole A in the rear part of the remote keyboard (fig. 02).
For the wall installation, after removing the front part, on the wall where the keyboard is going to be installed, make no. 4 holes with 4 mm diameter with the correct distance (see diagram in fig. 02).
After preparing the connections, close back the front part of the keyboard by simply pressing with your fingers.

Fig.1

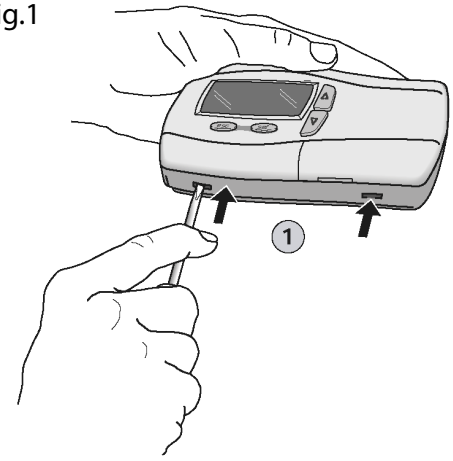
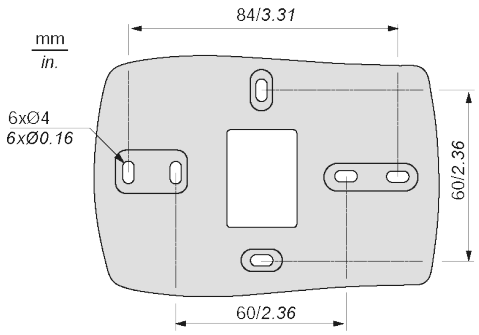
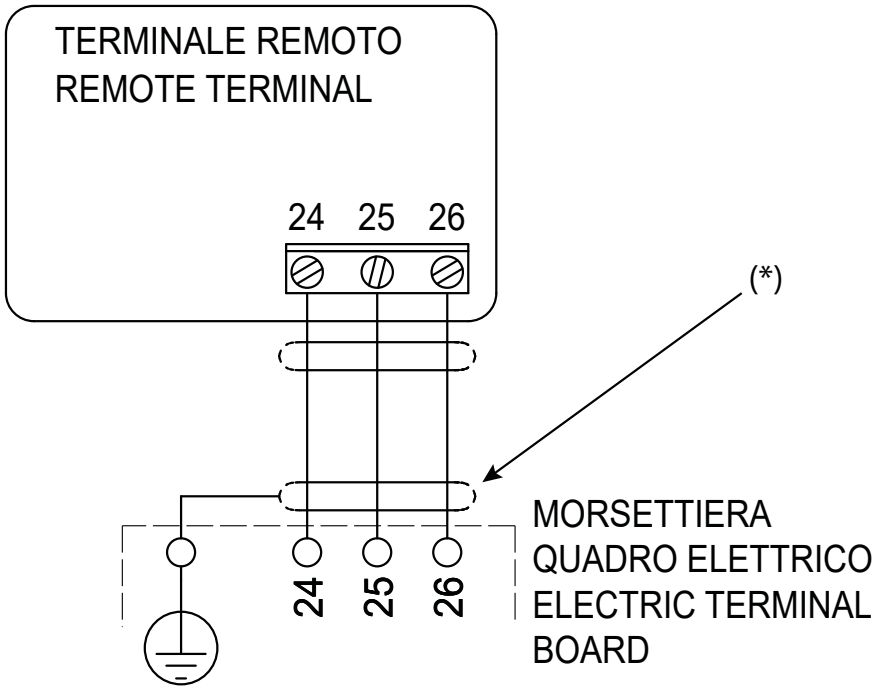


Fig.2

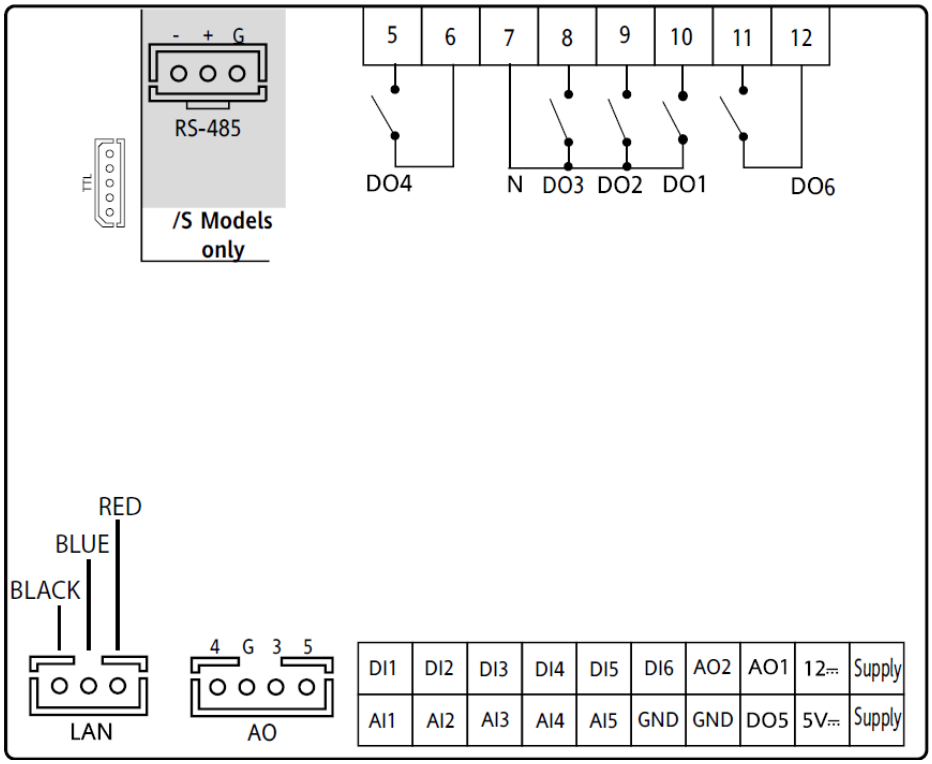


5 REMOTE KEYBOARD CONNECTION



24:blue
25: red
26: black
(*): no. 3 shielded electrical cables not shielded (max. length 100 m; minimum section 0.5 mm^2)

Layout control unit rear view on the machine



The following rules must be followed when doing the connections:
— do not apply loads greater than the ones included in these specifications on the outputs;
— when connecting the loads, carefully observe the connection diagrams;

— keep the power cables separated from the signal cables to prevent interferences.

Analogue inputs

The analogue inputs are 5:
— 3 inputs for the NTC temperature probes;
— 1 configurable input for NTC probe or for signal 4...20 mA. The following inputs are identified as AI1…AI5.

Digital inputs

The digital inputs, free from voltage, are 6 and are identified below as ID1…ID6.

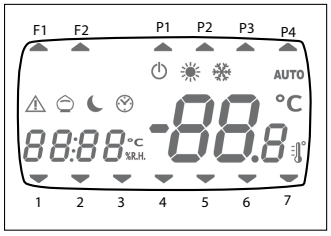
Remote keyboard connection

Connect the three wires as per the wiring diagram.

CAUTION

Do not connect the keyboard with the instrument powered on. Avoid the short-circuit between cables with the instrument powered on: they could damage the instrument.

6 USER INTERFACE



The interface, consisting of the remote keyboard, makes it possible to carry out all operations related to the use of the instrument, in particular:
— Set the operating mode
— manage the alarm situations
— check the status of resources

Displays

The device can communicate any type of information regarding its status, configuration and the alarms through the display and LEDs on the front side.

6.1 BUTTONS

Buttons	Function
ESC	By long pressing, the operation mode is selected. If the mode heat is enabled (default setting), each time the key is pressed, the following sequence is displayed: cooling --> heating; If the heat mode is not enabled: cooling
SET	By long pressing, the NIGHT function is selected. Press the key briefly and the SET menu is selected.
ESC SET	Press the key briefly and the PRG menu is selected.
⌃⌃	By long pressing, the menu SCHEDULER (hourly bands) is selected. Press the key briefly and the ECO function is selected.
⌃⌃	By long pressing: ON/OFF. Press the key briefly and the alarms are reset.

6.2 DISPLAY

The normal display shows the following:
— the regulation temperature, in tenths of Celsius degrees with decimal dot
— the alarm code if at least one is active. In case of more active alarms, the first is displayed according to the Alarms Table.

LED

▼ 1 compressor
▼ 2 fan M/R
▼ 3 reverse cycle valve
▼ 4 water pump /electric coil
▼ 5 alarm
▼ 6 Freecooling

Defrost led

❄

— ON if defrosting active
— OFF if defrosting disabled or finished
— BLINKING if time counting is in progress (defrosting interval)

Economy led

ON if the controller is in the economy mode

Defrosting led

ON at the same time: defrosting active

Heating led

ON is the device is in the heating mode

Cooling led

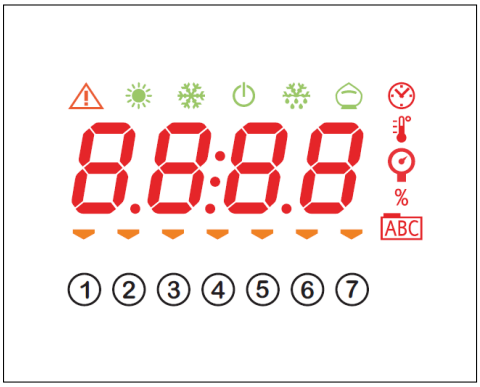
ON is the device is in the cooling mode

Alarm led

ON if at least one alarm is present. If blinking, it is needs to be manually reset.

6.3 CONTROL UNIT ON THE MACHINE

The terminal on the machine is a true copy of the information that appear on the remote keyboard.
The functionalities are identical to the ones listed in the keys and displays section.

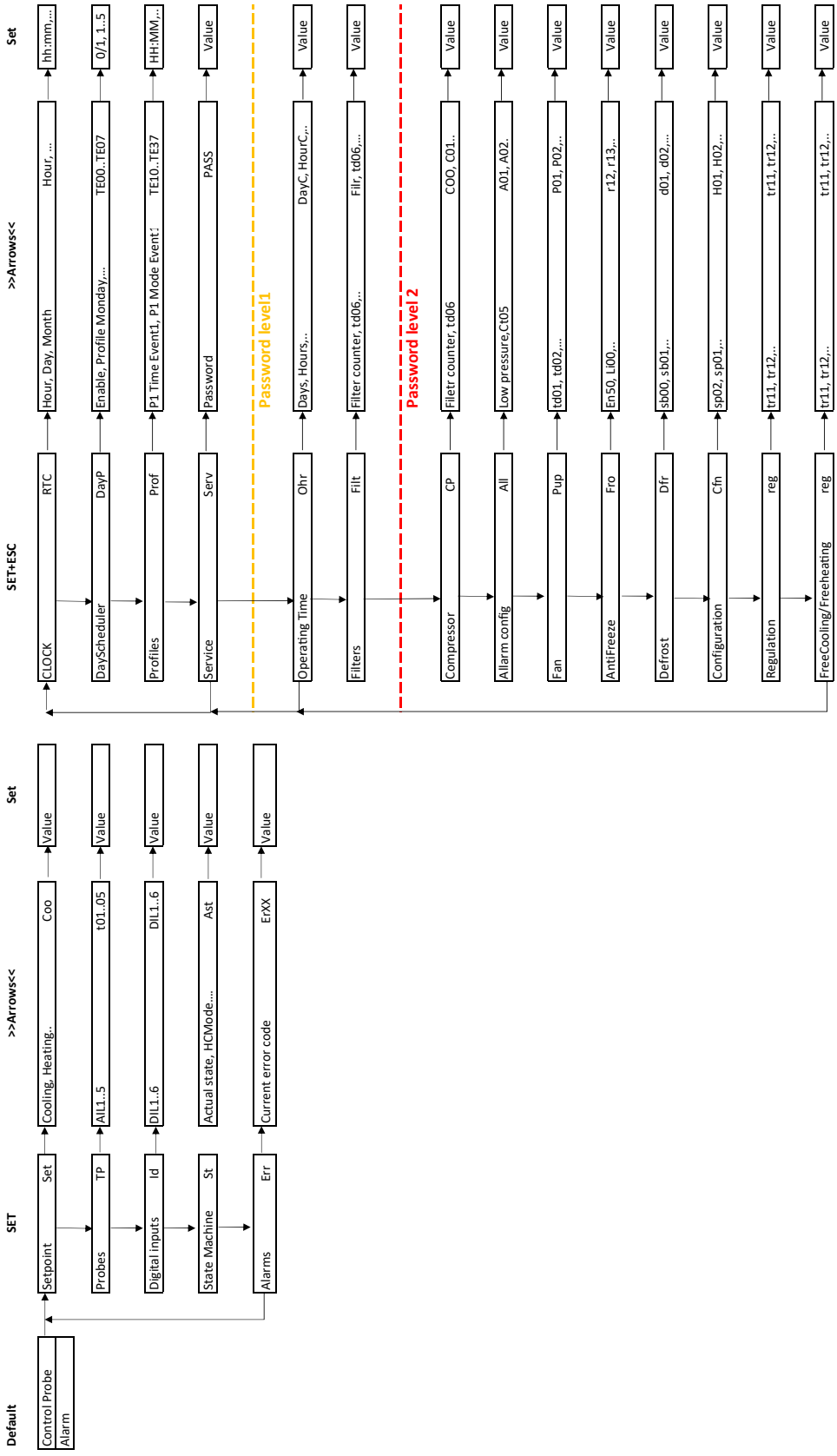


6.4 PARAMETERS PROGRAMMING - MENU STRUCTURE

Parameters on the device can be changed from the keyboard. Access to the various parameters is organised in sub-levels, which can be accessed by pressing at the same time the keys ESC and SET (see above). Each menu level is identified by a mnemonic code that can be seen on the display. For further information, see the following page.

7 MENU STRUCTURE

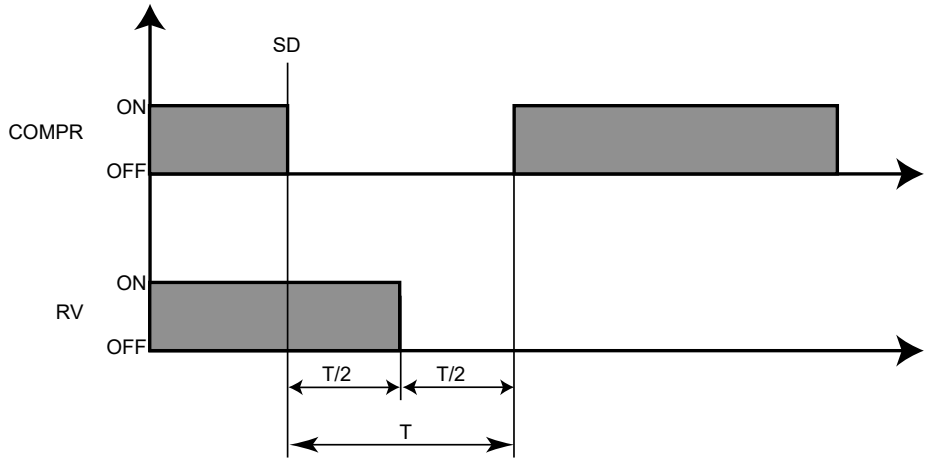
Access to the different levels: Level 0 always shows the recovery temperature or, if active, an alarm. To move between levels and labels, use the arrow keys.



8 FUNCTIONS

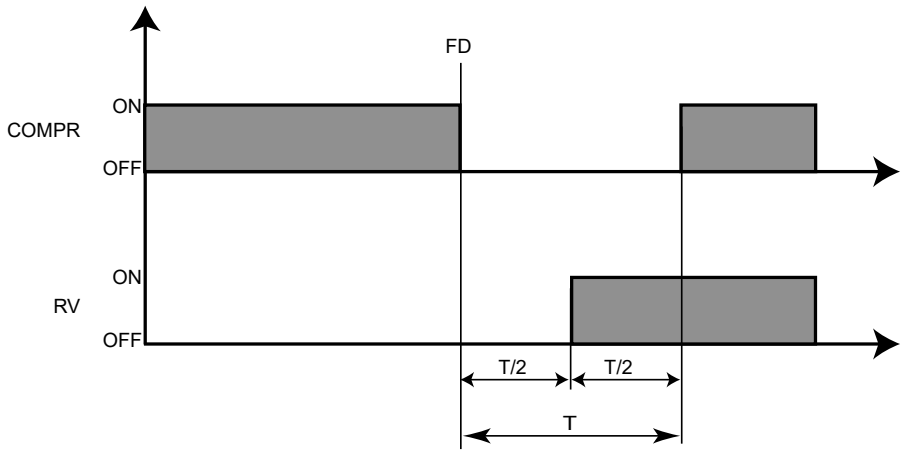
Control is configured from the factory and it controls the unit according to the temperature and pressure condition detected by the probes and to the already defined thermo-regulation functions.
The following operation modes are possible:
— **Cooling**: this is the "summer" operating mode; the machine is configured to generate cold.
— **Heating**: this is the "winter" operating mode; the machine is configured to generate heat.

Fig. 01



COMPR: compressor
RV: inversion valve
SD: start defrosting

Fig. 02



COMPR: compressor
RV: inversion valve
FD: end defrosting

8.1 SETPOINT SETTING

The activation or deactivation of the users depends dynamically on the set thermo-regulation functions, on the temperature values detected by the probes, and on the set setpoints.
The defined temperature setpoints are 4:
SetPoint Cooling: it is the reference setpoint when the device is adjusted in the cool mode (cold)
SetPoint Heating: it is the reference setpoint when the device is adjusted in the heat mode (hot)
SetPoint Cooling economy (COOE): it is the reference setpoint when the device is adjusted in the cool mode (cold) and in the economy regime
SetPoint Heating economy (HEAE): it is the reference setpoint when the device is adjusted in the heat mode (hot) and in the economy regime

The setpoint can be adjusted from the keyboard by accessing the submenu "SET" (see menu structure).

8.2 ON/OFF FROM DIGITAL INPUT

The input must be enabled during the first start-up.
The digital input ID4 becomes the ON-OFF command function. If this type of input is enabled, the instrument shuts down all users.

8.3 INTEGRATION HEATERS REGULATOR OR HOT WATER COIL (ACCESSORIES)

Reference Fig. 01.

In the heating mode, the heaters or the coils are activated when AI1 < (SET Heating - related Offset). If the heat pump is disabled because the outside temperature is too low, the heaters or the coils adjust directly on the heating set-point.

8.4 FREE COOLING AND FREEHEATING (OPTIONAL WITH RELATED ACCESSORY)

The free cooling and freeheating functions make it possible to cool or heat the indoor environment by using the outside air. The outside air goes into the room without exchanging heat with the exhaust air by means of a damper that lets the exhaust air go out without passing through the heat recovery unit. The damper control is ON/OFF.

FREECOOLING

The free cooling set is calculated by subtracting from the cooling set the value equivalent to the parameter "offset free cooling in cool". In fact, if the free cooling set coincides with the cooling set, when the compressors are turned off, at the same time the damper would close down preventing thus the energy saving arising from the use of the colder outside air.
This relationship is valid if:
— the outside temperature is lower than the cooling set
— the indoor temperature is greater than the outside temperature.

FREEHEATING

The freeheating set is calculated by adding to the heating set the value equivalent to the parameter "offset free cooling in heat". In fact, if the freeheating set coincides with the heating set, when the compressors are turned off, at the same time the damper would close down preventing thus the energy saving arising from the use of the warmer outside air.
This relationship is valid if:
— the outside temperature is higher than the heating set
— the indoor temperature is lower than the outside temperature.

8.5 DAMPER CLOSING DUE TO LOW TEMPERATURE

By allowing too much cold air into the room, the occupants well-being may suffer from it. For this reason, if the outside temperature is lower than the "free cooling block set point", the damper is forced to close down. If the outside temperature is greater than a "free cooling block set point", the free cooling adjustment goes back to normal.

8.6 RECORDING OF OPERATING HOURS

The device saves to the non-volatile memory the fan's operating hours.
The information is displayed by accessing the special menu with the Ohr label (see menu structure).

8.7 DEFROST

Defrosting is a function that is active only in the heating mode. It is used to prevent the formation of ice on the surface of the heat exchanger. This reduces considerably the thermodynamic yield of the machine and poses the risk of damages to the machine itself.
The regulation takes place depending on the pressure.
Entering and exiting defrosting depends on the values of the condensation probes and on the settings of the parameters described below.

8.8 ENTERING DEFROST

Reference Fig. 01.

If the condensation pressure drops below the defrosting start pressure and the compressor is ON, the call counting starts. When the counting is over, the instrument starts the defrosting process. There is a delay time between the compressor shut down and the valve activation (T time in fig. 01).
This delay prevents possible liquid returns in the compressor. During this cycle, the compressor safety times are ignored.

8.9 EXIT FROM DEFROSTING

Reference Fig. 02.

The exit from the defrosting operation takes place if:
— the pressure increases above the pressure at the end of the defrosting,
— the duration of the defrosting reaches a preset time (max defrosting time) at the end of defrosting,
— with the delay time between the compressor shut down and the activation of the valve (T time in fig. 02)

8.10 COUNTING MODE

— The counting of the defrosting interval interrupts when the pressure increases above the pressure at the start of defrosting.
— The counting is reset after one of the following events: defrosting cycle carried out, power failure, operating mode change.

8.11 POWER FAILURE

In case of power failure, when power is restored, the control returns to the status prior to the power failure. If defrosting is in progress, the procedure is cancelled. All timings are cancelled and initialised again.

8.12 MANAGEMENT OF SUMMER/WINTER MODE CHANGE

The change can take place:
— from digital input (if enabled)
  ◦ control on the machine: the icons summer/winter blink
  ◦ remote panel: the icons summer/winter are fixed
— from keyboard (if the digital input is disabled)
  ◦ control on the machine: the icons summer/winter are fixed
  ◦ remote panel: the icons summer/winter blink when a mode change is performed, they remain fixed after 10 seconds
— from supervision

8.13 DELIVERY/RECOVERY FAN CONTROL

The fans are off only if:
— a fans block alarm is present
— the unit is OFF

8.14 SUMMER NIGHT FUNCTION

The function is enabled via parameter or time bands and it is enabled only if the free cooling conditions are met. The night function has higher priority compared to the possible stand-by mode.
In case the above conditions are present:
— the free cooling function is activated with null equivalent band (full open or closed dampers)
— if the opening of the damper was requested, the fans are activated
— all other functions are disabled

The function can be disabled in two ways:
— by time-out if the time bands are disabled;
— by manual mode/function change, OFF, time bands disabling.

8.15 TEMP. TIMER

Profiles configuration
The operating modes for each profile are defined via the "Prof" mask in the "prg" menu

The profile will be identified as "tE0n x" where n is the number of the day of the week and "x" is the set profile.
— tE01 = Monday profile
— tE02 = Tuesday profile
— tE03 = Wednesday profile
— tE04 = Thursday profile
— tE05 = Friday profile
— tE06 = Saturday profile
— tE07 = Sunday profile

Time bands management

To activate/deactivate the time bands, it is possible to press for a few seconds the UP arrow key.
The controller on the machine will display the clock icon while the display of the remote control panel will show the F1 icon symbol and the corresponding active profile.
The time bands include 5 profiles (defined via the Prof mask of the prg menu):
— profiles 1, 2, 3 with four events each

Each EVENT consists of a start time (in the format HH:MM) and an operating mode (0 = OFF, 1 = ECO, 2= COMFORT, 3 = NIGHT).
— Profile 4: only Comfort
— Profile 5: only Off

From the DayP, the scheduler can be activated with the parameter tE00. Then each day of the week can only have one of the 5 possible profiles, by setting the parameters tE01….tE07 from 1 to 5 for each day of the week.

9 DIAGNOSTIC

The control can perform a full diagnostics of the unit by reporting a series of alarms. The activation and reset modes are set via the factory parameters.
For some alarms, the notification exclusion is provided for a length of time preset via a parameter.
The manual reset alarms can be reset by pressing and releasing the arrow key downwards.
A manual reset alarm entails the block of the corresponding functions and the operator's intervention on the unit.

9.1 LIST OF ALARMS

The activation of an alarm results into two actions:
— block of the interested users
— notification on the keyboard display

The notification consists of an "Ernn" or "ALnn" type of code (nn shows a 2 digit number that identifies the type of alarm, e.g.: E01, AL23, ecc.).

Alarm code	Description
AL01	Compressor maximum number of hourly activations exceeded
AL22	High pressure on the cooling circuit alarm
AL23	Low pressure on the cooling circuit alarm
Er01/Er20	Wrong regulation temperature probe
Er04	Clock error
Er05	Anti-freeze alarm
Er08	Remote panel communication error
Er10	Compressor thermal protection error / high pressure from digital input alarm
Er11	Fan thermal protection alarm
Er21	Outside temperature probe error
Er41	Exceeded maximum number of hours set for filters
Er50	Low Pressure Sensor Error
Er51	High Pressure Sensor Error

10 USE OF THE DEVICE

Permitted use

For the purpose of safety, the control device will have to be installed and used according to the instructions provided and, in particular, in normal conditions, parts with dangerous voltage must not be accessible. The device must be protected from water and dust and must also be only accessible by means of a tool.
According to the reference regulations, the device is classified:
— According to the construction as an automatic electronic control device to be added with independent assembly or to be integrated;
— According to the characteristics of the automatic operation as type-1 action control device with regard to the manufacturing tolerances and drifts;
— As class 2 device with regard to the protection against electrical shocks;
— As class A device with regard to the software class and structure.

Non permitted use

Any different use from the permitted one is forbidden.
It should be noted that, the relay contacts are of the functional type and are subject to faults; because they are controlled by an electronic part they can short-circuit or remain open. Possible protection devices according to the provisions of the product regulation or suggested by common sense, referring to obvious safety needs, must be implemented outside of the instrument.

11 LIABILITY AND RESIDUAL RISKS

The producer is not liable for possible damages arising from:
— installation/use different from the expected ones and, in particular, dissimilar to the safety prescriptions according to the provisions or the regulations in force and/or to the ones contained herein;
— installations that do not ensure adequate protection against electrical shocks, water and dust in the assembly conditions;
— installations that allow access to dangerous parts without the use of tools;

12 TECHNICAL FEATURES

Front protection	IP40
Container	ABS plastic material white
Dimension (max. sizes)	137 x 96.5 x 31.3 mm (LxHxB)
Mounting	wall mounted
Operating room temperature	-5... 60°C
Storage room temperature	-20... 85°C
Operating and storage environment humidity	10... 90%RH
Consumption	1 W max
Power supply	12V ~ from the electrical panel of the unit

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